REMARKS

Claims 2-8, 10-15 and 17-24 are pending in the above identified application. The Examiner has rejected claims 2-8, 10-15 and 17-24. Applicant has amended claim 2 for clarity. Applicant hereby traverses the Examiner's rejections.

Claims 2-8

The Examiner has rejected claims 2-8 under 35 U.S.C. 103(a) as being allegedly unpatentable over Yoshioka et al. (US Patent 6,425,039) in view of Worley, Jr. et al. (US Patent 5,596, 733).

The Examiner states that "Yoshioka fails to disclose exception registers that are switched for general purpose registers when an exception occurs." (Office Action, page 2). The Examiner asserts, however, that Worley cures the deficiencies in the teachings of Yoshioka because "Worley discloses a set of exception registers (fig.2, 106), (col.8, lines 41-51) wherein if such an exception occurred, the selects the default value for the exception from the storage table 176, (col. 10, lines 23-33)." (Office Action, page 2).

However Worley does not teach "a set of dedicated exception registers that are switched for at least a subset of said set of general purpose registers during servicing of an exception, wherein said set of exception registers is substantially dedicated for servicing exceptions," as is recited in claim 2, and therefore does not cure the deficiencies of Yoshioka. In fact, Worely does not teach that exception registers are "switched for at least a subset of said set of general purpose registers during servicing of an exception," as is recited in claim 2.

Worley, instead, teaches servicing certain exceptions by substituting a provisional instruction into the general registers in advance of execution that is utilized if the exception condition occurs. As described by Worley,

> the instruction set of a computer . . . is enhanced by including one or more "fix-up" instructions that effect a simple corrective action such as substituting a default value in response to an instruction producing one or more specified exceptions.
>
> In one embodiment of the invention, for example, a conditional substitution instruction is included in a pipelined computer's instruction set. The conditional substitution instruction specifies a set of one or more possible exceptions, a default value, and a result register. The conditional substitution instruction is inserted in a program after a potentially excepting instruction for which substituting the default result will permit continued program execution. If the potentially excepting instruction produced the specified exception when executed, then the conditional substitution instruction substitutes the default value for the excepting instruction's result stored at the result register.

(Worley, col. 4, line 56, - col. 5, line 6). Therefore, Worley teaches that in anticipation of an exception which has a simple fix, conditional substitution instructions are placed in the instruction set to place a substitute result in a result register if that exception occurs. Worley does not teach "switching registers," instead the provisional exceptions are already inserted into the general registers when the code is executed and no switching occurs upon detection of an exception.

For further clarification, a specific example disclosed in Worley is the exception generated by the case where x becomes 0 in the calculation of the function sin(x)/x. In accordance with the teachings of Worley, a provisional exception would have been placed in the general registers that detect the x=0 condition and provide the result 1 without invoking an exception to generate a divide-by-zero error. As Worley states,

> it is possible to recover from exceptions through the use of a conditional substitution instruction 92 performed after an

> exception producing instruction whose exception can be anticipated and corrected by substitution of a default result. For example, if the floating point divide instruction 68 is part of a series of instructions which calculate the function sin(x)/x, the conditional substitution instruction 92 can be used to substitute the known value of the function for x equal to zero (i.e., one) when the divide instruction produces a divide by zero exception. Substitution of a known default result by a conditional substitution instruction can be used to correct various other exceptions such as overflow and underflow exceptions by substituting a large negative or positive number, and invalid address exceptions by substituting a null value.

(Worley, col. 7, lines 49-64).

Worley further discuses an embodiment which provides the result from a table created in advance of program execution in anticipation of the possibility of the exception. With reference to Figure 8 of Worley, Worley discloses that

> [i]n the computer system 170, the conditional substitution instruction sets up the substitution of a default value for the result of an excepting instruction in advance. This is done by storing a default value for a set of one or more exceptions in the storage table 176.

(Worley, col. 10, lines 3-7). There is no teaching of substituting exception registers for general purpose registers during servicing of an exception.

Therefore, Worely teaches providing a substitute response to an exception so that the program can continue executing and not "a set of dedicated exception registers that are switched for at least a subset of said set of general purpose registers during servicing of an exception," as is recited in claim 2 (as amended).

Claim 2, then, is allowable over the combination of Yoshioka and Worley. Claims 3-8 depend from claim 2 and therefore are allowable over Yoshioka and Worley for at least the same reasons as is claim 2.

Claims 20- 24

The Examiner has apparently also rejected Claims 20- 24 under 35 U.S.C. 103(a) over the combination of Yoshioka (U.S. Patent No. 6,425,039) and Worley. (Office Action, pages 4-5) Again, the Examiner recognizes that "Yoshioka fails to disclose dedicated exception registers that are switched for general purpose registers when an exception occurs." The Examiner further asserts that the deficiency in Yoshioka is cured by Worley because "Worley discloses a set of exception registers (fig.2, 106), (col.8, lines 41-51) wherein if such an exception occurred, the selects the default value for the exception from the storage table 176, (col. 10, lines 23-33)." As discussed above during the discussion of claims 2-8, Worley does not teach "a set of dedicated exception registers that are switched for at least a subset of said set of general purpose registers only when an exception having at least a predetermined priority level is detected by said processor and that are not switched when an exception having a priority less than the predetermined priority level is detected by said processor," as is recited in claim 20, because Worley does not teach switching of exception registers with general purpose registers "when an exception . . . is detected by said processor." Worley, therefore, does not overcome the deficiencies in Yoshioka ('039).

Claim 20, therefore, is allowable over the combination of Yoshioka ('039) and Worley. Claims 21-24 depend from claim 20 and are allowable for at least the same reasons as is claim 20.

Claims 10-12, 13-15, 17-19

The Examiner has rejected claims 10-12, 13-15 and 17-19 under 35 U.S.C. § 103(a) as allegedly "being unpatentable over Yoshioka et al. (US Patent 6,038,661) in view of Worley, Jr. et al. (US Patent 5,596,733)."

With regard to claim 12, the Examiner states that "Yoshioka fails to disclose swapping a set of general purpose registers for exception registers if an exception is a high priority exception and swapping out exception register and resuming execution of task if exception is high priority." The Examiner again asserts that Worley makes up the deficiency because "Worley discloses a set of exception registers (fig.2, 106), (col.8, lines 41-51) wherein if such an exception occurred, the selects the default value for the exception from the storage table 176, (col. 10, lines 23-33) and if an exception produced assigned priority. (col.9, lines 50-54)." As discussed above (see Discusion of claims 2-8), Worley does not teach "swapping a set of general purpose registers for at least one set of exception registers if an exception asserted at said processor is a high priority exception," or "swapping out said exception registers for said set of general purpose registers and resuming execution of said task if said exception is a high priority exception," as is recited in claim 12. As discussed in detail above, Worley does not teach any form of swapping or switching exception registers with general purpose registers when servicing an exception.

Therefore, claim 12 is allowable over the combination of Yoshioka and Worley. Claims 10-11, 13-15 and 19 depend from claim 12 and are therefore allowable over the combination of Yoshioka and Worley for at least the same reasons as is claim 12.

Further, as discussed above, Worley does not teach "means for servicing said exception without disrupting the state of the interrupted task, including means for activating at least one set

of dedicated exception registers; and means for resuming execution of said interrupted task, including means for deactivating said dedicated exception registers and activating general purpose registers to resume execution of said task," as is recited in claim 17. Claim 18 depends from claim 17 and is allowable for at least the same reasons as is claim 17.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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